HAWKER SIDDELEY
Safetran Systems

Instruction
& Maintenance

Models IW20
IW20RT

8.5

Unilens II Color Light Signal

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Safetran Systems

Instruction & Maintenance
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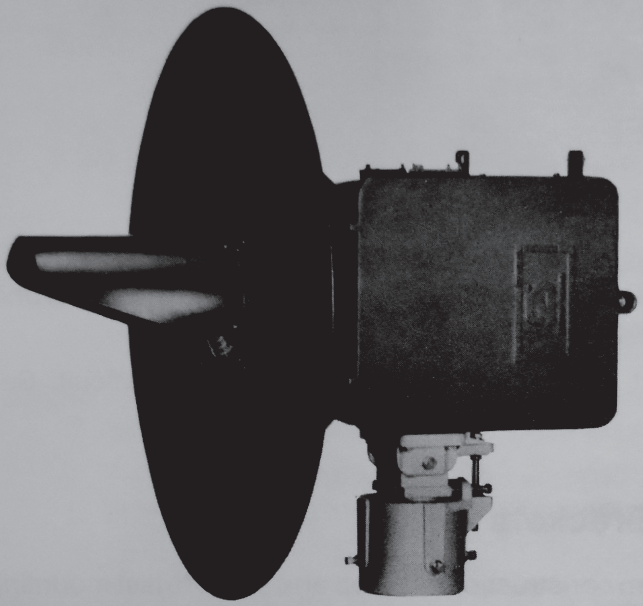
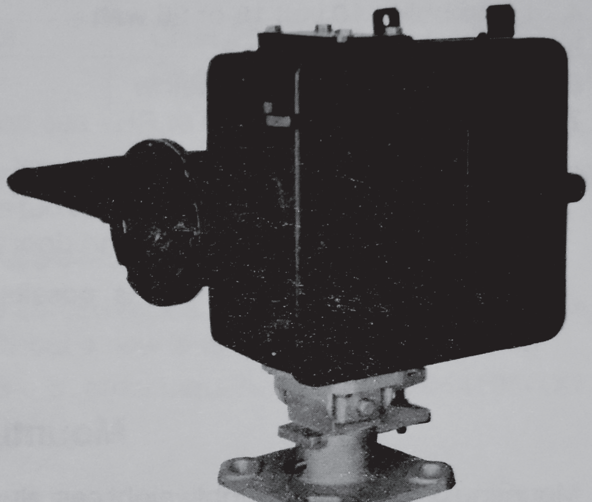
Unilens II Color Light Signal



IW20



IW20RT

The UNILENS II is a railroad wayside color light signal capable of providing up to four different color indications with a single lens. Light transmission from individual lamp-color filter modules is carried in a fiber optic conductor to the common output lens.

The lamp-color filter modules each consist of a standard S11 type 10 volt, 18 or 25 watt precision signal lamp bulb, precision die cast aluminized polycarbonate reflector and glass color filter. Two, three or four modules may be used for up to four signal color indications. Light output, circuity and operation are the same as a conventional color light signal, yet size is near that of a single color light or searchlight signal.

The UNILENS II is available with 8-3/8" diameter (Model IW20) or with 6-3/8" diameter (Model IW20RT) lenses. The output lens is high impact clear acrylic with optional center deflector. Spread lensing for curved track is available in both models.

The housing, doors and mounting brackets are of lightweight cast aluminum construction. Neoprene door packing provides a weathertight seal between door and housing. A locking screw secures the hinged door to the lamp housing and utilizes a standard terminal wrench to open or close. Additional security may be provided by using a padlock to prevent access to the lock screw.

The optical system is prefocused to assure maximum light output. The only adjustment required is field alignment accomplished by using the built-in sighting device and the mounting bracket assembly vertical and horizontal adjustments.

A 2 ohm adjustable resistor is provided and connected to the common return for lamp voltage adjustment. Optional wiring without resistor, with multiple resistors and with transformers for 115 VAC operation is available.

Ordering Information

To Order: Specify Description and Part Number

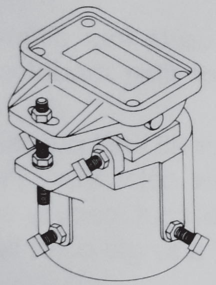
1. Model IW20 (8-3/8" lens) or Model IW20RT (6-3/8" lens)
2. Number of aspects - 2, 3 or 4
3. Aspect colors - green, yellow, red or lunar white
4. Lamp bulb - 10 volt 18 or 25 watt
5. Lens type - See page 3
6. Mounting desired - see below
7. Door configuration of LH or RH - see note

Note: Door Configuration. The UNILENS II utilizes a side opening door to access the lamp modules. A left hand door where the door opens out on the left side while sighting from behind the signal unit, will be furnished unless right hand door is specified.

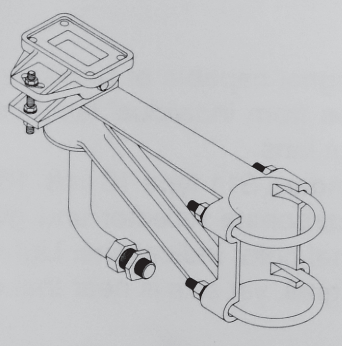
Field reversing of door side is possible but can make wiring and alignment difficult. See instructions on page 8.

Mounting Brackets

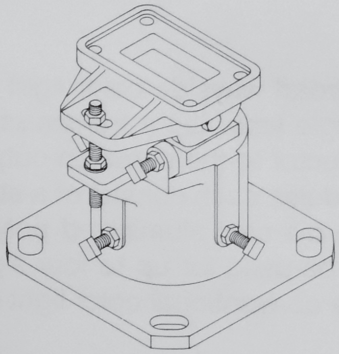
Mounting brackets are of lightweight cast aluminum construction. The top and side of mast mounting brackets will be furnished for 5 inch pipe mast mounting unless otherwise specified. The mounting base assemblies require 6-3/4" x 6-3/4" or 8" x 8" inch foundation bolt spacings.



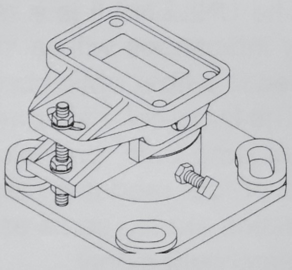
Top of Mast Mounting



Side or Front of Mast Mounting



Mounting Base 8" x 8" Bolt Spacing



Mounting Base 6-3/4" x 6-3/4" Bolt Spacing

Description	Part Number
Top of Mast Mounting Bracket for 5" Pipe Mast	042254-2X
Side or Front of Mast Bracket for 5" Pipe Mast	042256-22X
Mounting Base for 8" x 8" Bolt Spacing	042275-3X
Mounting Base for 6-3/4" x 6-3/4" Bolt Spacing	042275-14X
Side or Front of Mast Bracket, 5" Tube Type for Internal Wiring (Top of Mast Bracket 042254-2X Required When Using Tube Type Bracket)	042256-4X (Not Shown)

Side wall and overhead pipe flange mountings can be furnished as specified.

Lenses

Diameter	Focal Length	Deflection	Material	Part Number
8-3/8"	6"	40 Deg. Centerspot	Clear Plastic	042295-1
8-3/8"	None	20 Deg. Deflecting See Note 1	Clear Plastic	042257-8
6-3/8"	3-3/4"	40 Deg. Centerspot	Clear Plastic	042210-1
6-3/8"	3-3/4"	30 Deg. Spread See Note 2	Clear Plastic	042210-6L

Note 1: The 8-3/8" 20 deg. deflecting roundel for curved track application is mounted over the standard lens using an adapter ring.

For field installation, order **Roundel/Adapter Kit #044023-X1**

Note 2: The 6-3/8" 30 deg. lens has both the lens and spread optics in a single lens, however it is **not interchangeable** with the standard lenses without a new lens casting and refocusing.

To modify from standard to spread lensing for 6-3/8", order **Lens/Adapter Kit #044105-1X1** and refocus signal per instructions on page 8.

Lamp Bulbs

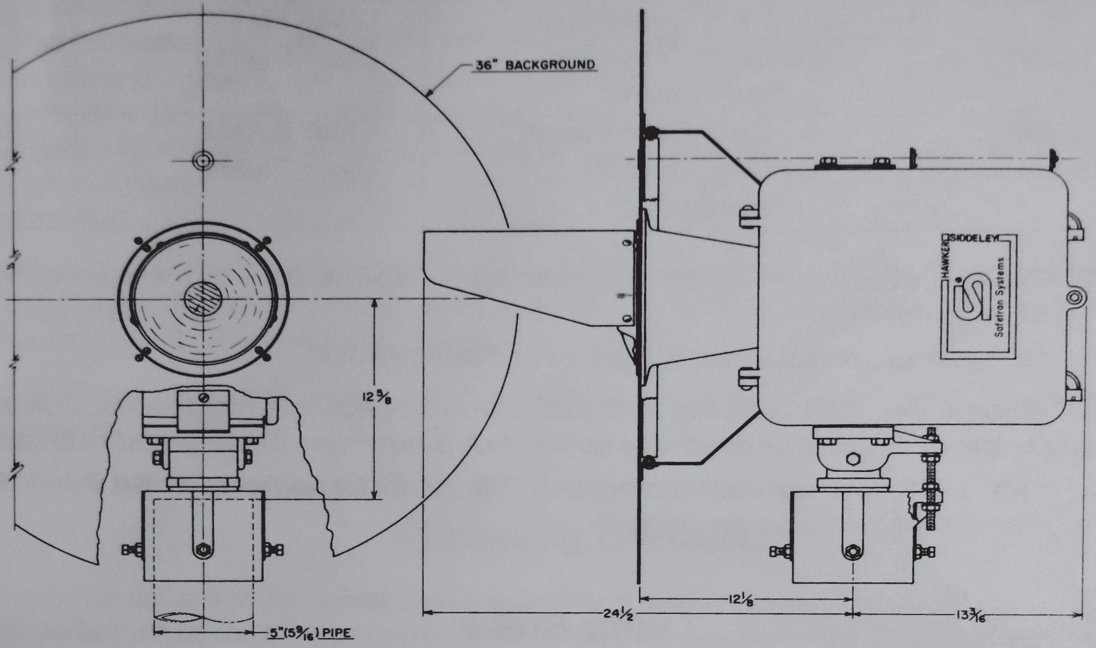
The UNILENS II is designed to use standard S-11 signal precision incandescent lamps of 10V18W or 10V25W rating. Do not use halogen cycle lamps (QI 10/16 etc.) as the heat concentration is too great for the enclosed mounting.

Voltage	Wattage	Part Number
10	18	042365
10	25	042365-3
10	18/3.5	042365-11

Backgrounds and Visors

Description	Part Number
36" Alum. Background W/Brkts and Hardware	044114-1X1
36" Alum. Background Only	044114-X1
12" Alum. Visor (8-3/8" lens)	044018-X
12" Plastic Visor (8-3/8" lens)	042005-3AX
6" Alum. Visor (6-3/8" lens)	042005-107X
6" Plastic Visor (6-3/8" lens)	042005-19X

Outside Dimensions


36" BACKGROUND
12 5/8
5"(5 9/16) PIPE
24 1/2
12 1/8
13 3/16
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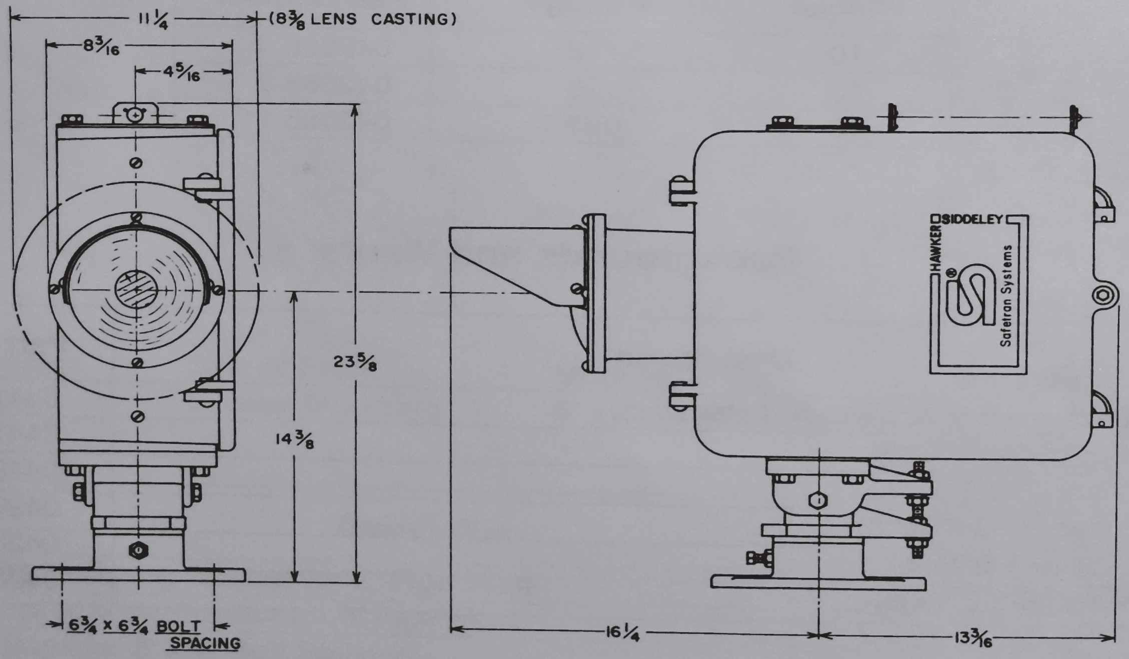
UNILENS® II Model IW-20, 8-3/8 D. Lens
Top of Mast, LH Door Shown


11 1/4
(8 3/8 LENS CASTING)
8 3/16
4 5/16
23 5/8
14 3/8
6 3/4 x 6 3/4 BOLT SPACING
16 1/4
13 3/16
HAWKER SIDDELEY
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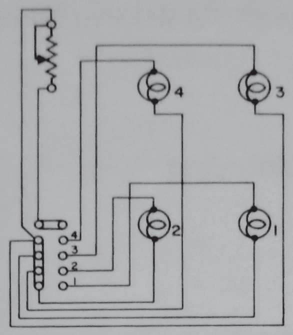
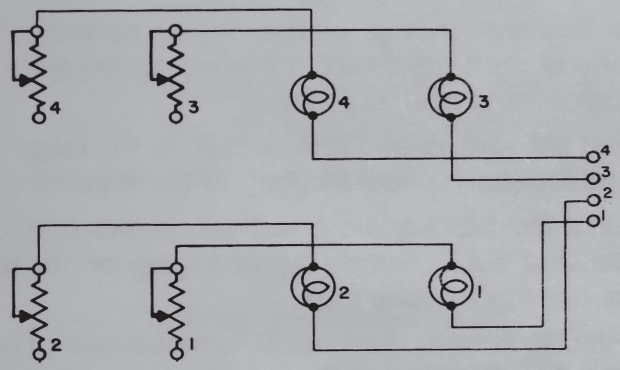
UNILENS® II Model IW-20RT, 6-3/8 D. Lens (8-3/8 D. Lens Optional)
Dwarf Base, LH Door Shown

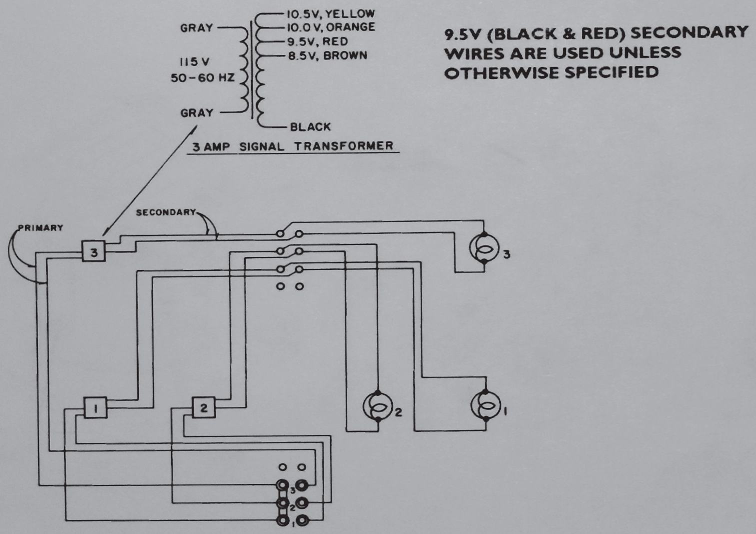
Wiring Diagrams



Standard Wiring 4 Aspect*


4
3
4
3
4
3
2
1
2
1
2
1

Special with Resistor for Each Lamp 4 Aspect*


GRAY
115 V
50-60 HZ
GRAY
10.5V, YELLOW
10.0 V, ORANGE
9.5V, RED
8.5V, BROWN
BLACK
3 AMP SIGNAL TRANSFORMER
PRIMARY
SECONDARY
3
1
2
3
2
1
3
2
1

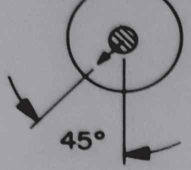
9.5V (BLACK & RED) SECONDARY WIRES ARE USED UNLESS OTHERWISE SPECIFIED

Special with Transformers for 115 VAC
3 Aspect Shown, 4 Aspect* also Available

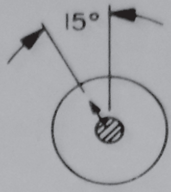
* Standard Color Positions Are: 1. Red 2. Yellow 3. Green 4. Lunar White

Lens Alignment

The standard lens has a deflecting center spot intended for close up indication. The center spot arrow will be set for a right side signal at 45° from straight down for a mast mounted signal and 15° from straight up for dwarf mounted signal.



Mast Mounting



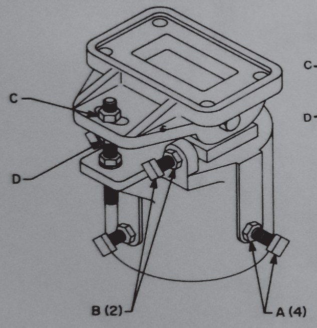
Dwarf Mounting

This setting must be checked at installation. To change direction of the deflecting center, simply loosen the lens ring screws, turn lens to desired setting and retighten screws.

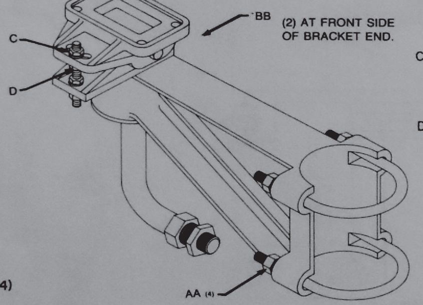
Signal Alignment

Using the sighting device located on top of the signal housing, both vertical and horizontal alignments can be made on any of the four different mounting brackets. Once the bracket has been mounted to the mast or foundation, proceed as follows:

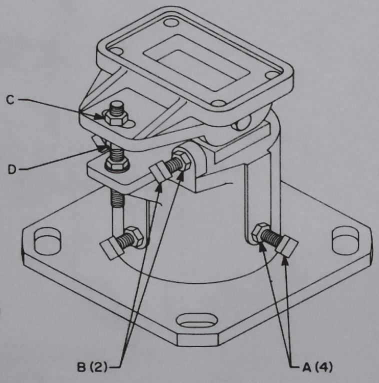
1. Loosen the 1/2" square head set screws and locknuts A, or the large u-bolt nuts AA, and rotate the signal to the desired general location. Secure tightly to the mast or base.
2. Horizontal alignment – loosen the 1/2" square head set screws and locknuts B, or the small u-bolt nuts BB, and the top vertical stud nut C. Rotate signal to proper horizontal location and retighten B or BB (and C if vertical alignment is already set).
3. Vertical alignment – with nut C loosened, turn nut D to move rear of bracket up or down for proper vertical alignment. Holding nut D, tighten nut C.
4. Recheck alignment and check that all screws and locknuts are tight.



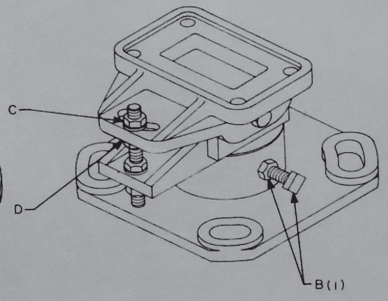
Top of Mast Mounting



Side or Front of Mast Mounting



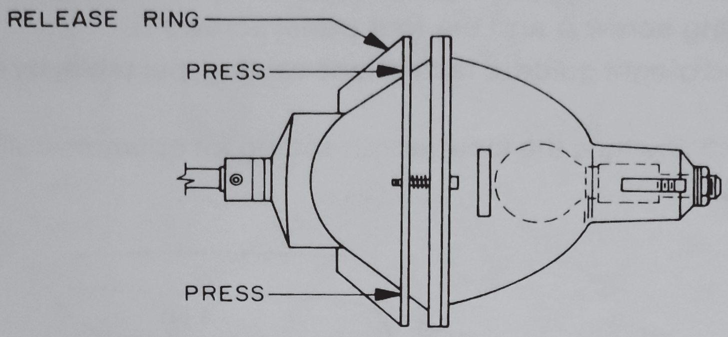
Mounting Base 8" x 8" Bolt Spacing



Mounting Base 6-3/4" x 6-3/4" Bolt Spacing

Lamp Bulb Replacement

Each lamp bulb and socket is within the reflector half of the lamp-color filter module. The reflector is held in place by three spring loaded pins. To remove, press in on the release ring and rotate the reflector counter clockwise. After changing the lamp bulb, replace reflector flange on pins, press release ring and turn reflector clockwise.



Lamp-Color Filter Module

Note: Lamp units are prefocused with a signal precision S-11 lamp bulb. Replacement lamp bulbs must also be **signal precision** S-11 incandescent type (do not use halogen lamps in this unit).

If light output is not normal, rotate the lamp bulb 180 degrees and reinstall. If still not normal, try another new lamp bulb.

Lens Replacement

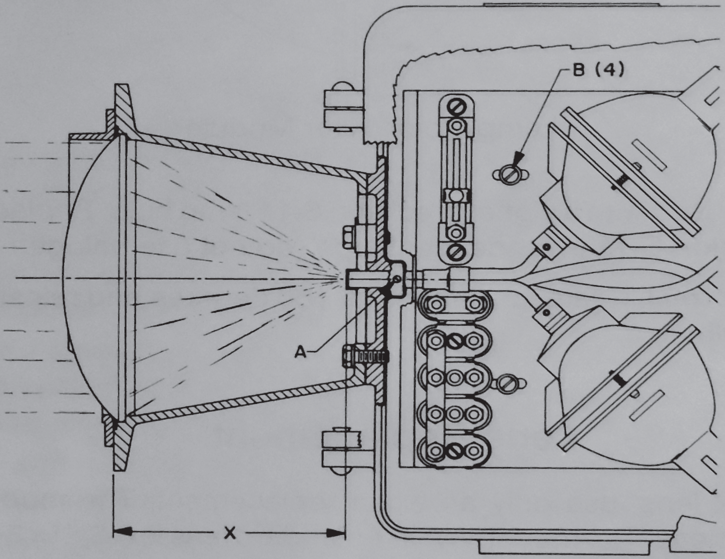
When replacing a signal lens, use only an exact replacement. The model IW20 uses a special 8-3/8" x 6" focal length acrylic lens. The model IW20RT standard lens is 6-3/8" x 3-3/4" focal length acrylic. A polycarbonate or spread lens, even with these same specifications, requires a special lens casting and refocusing.

Signal Focus

The UNILENS II has three distinct focus settings; the lamp bulb and reflector, the light guide end at the lamp-color filter module and the output light guide end to the lens. All of these are factory set and should never require refocusing.

A signal can be converted from 6-3/8" to 8-3/8" lens or from 6-3/8" standard to 6-3/8" spread lens for example. To do this a new lens casting is required and the output light guide must be set as follows:

1. Loosen light guide holding screw A and the four panel screws B.
2. Set distance "X" from end of light guide to face of lens casting, per table, by sliding the panel forward or back as required.
3. Check light indication and fine tune the focal length setting for optimum collimated beam indication.
4. Tighten screws A and B.



Lens		* Focal Length
Part No.	Description	Locating Dim. "X"
042295-1	8-3/8 D. x 6"F W/40° Ctr	5-25/32
042210-1	6-3/8 D. x 3-3/4"F W/40° Ctr	4-7/16
**042210-6L	6-3/8 D. x 3-3/4"F Spread	3-9/16

* Mean typical focal length setting, optically fine tuned at assembly.

** Special spread lens requires a special lens casting to obtain focus.

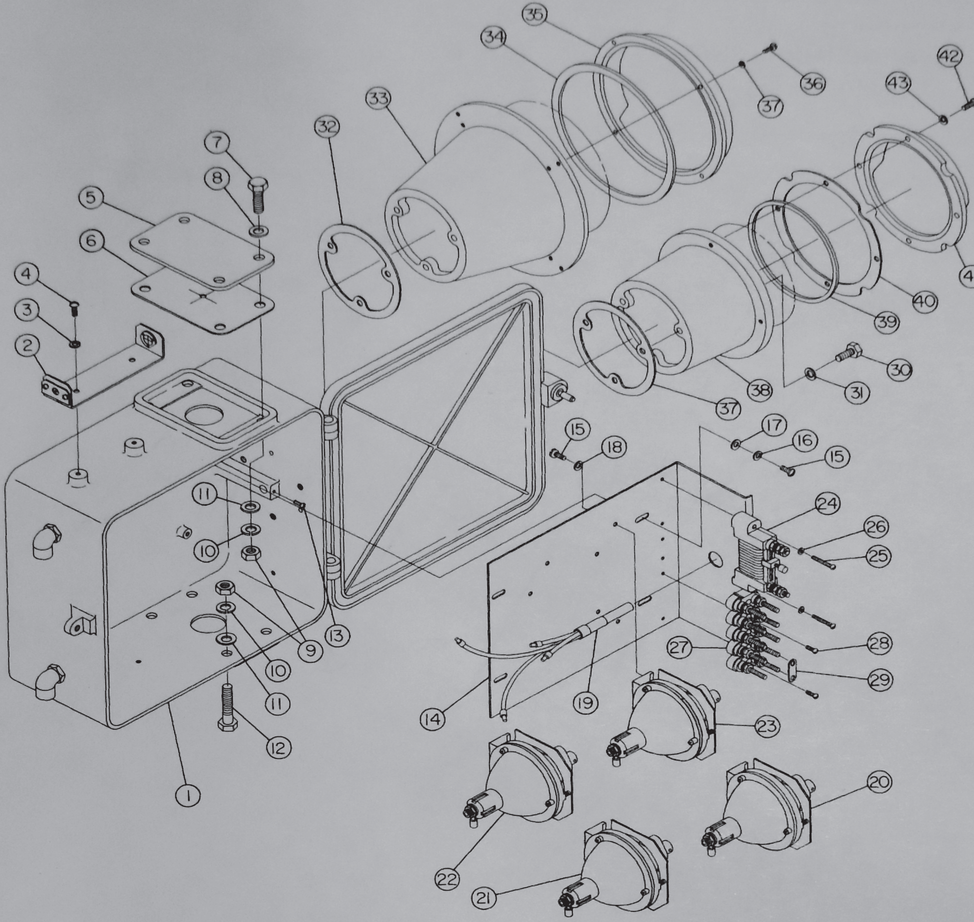
Reversing Door Side

Changing a left hand door signal to right hand (or reverse) can be done as follows:

1. Remove the mounting base and the top cover plate and remount them with the base on top and plate on bottom.
2. Turn signal over (base down) and change the vents at rear and the lens ring for visor at front to 180 degrees from original position.
3. Remove and discard the alignment sight, using the mounting screws to plug the holes.

Note: The location of the terminals and the alignment sight suit the door configuration as manufactured. Reversing the door side moves the terminals away from the wire entry point possibly making wiring difficult. Signal alignment must be done manually as the alignment sight accuracy is lost once it is removed from its factory set position.

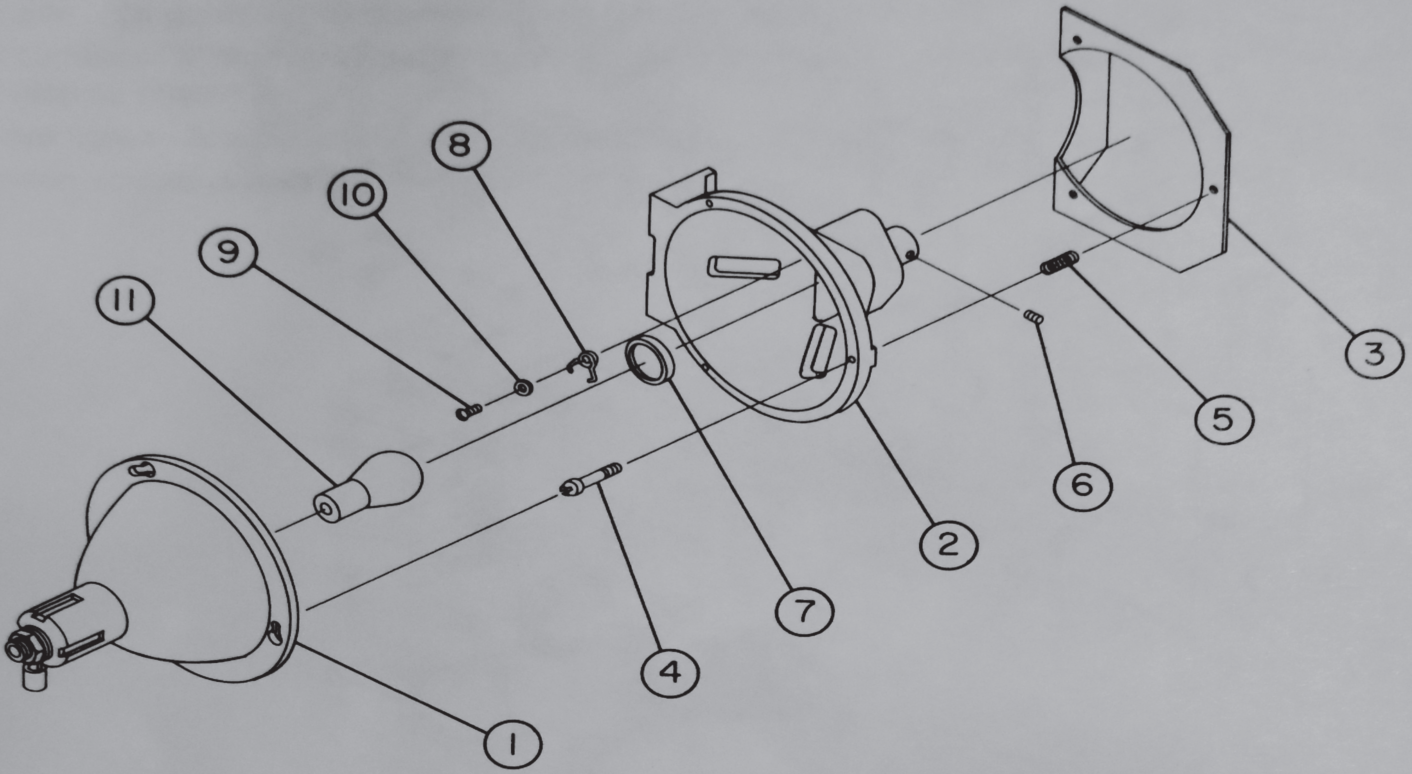
Unilens II Color Light Signal Replacement Parts



To Order: Specify Description and Part Number

Item No	Description	Qty. Req'd	Part Number	Item No	Description	Qty. Req'd	Part Number
1	Housing and Cover	1	044121-X	22	Adapter Assy, Green	1	044102-GX
2	Alignment Sight Assy	1	044117-X	23	Adapter Assy, Lunar White	1	044102-LX
3	W-LKS, M, 1/4	4	1808-MEJ	24	Resistor, Adjustable	Varies	029602-6X
4	MS-RH, 1/4-20 x .75"	4	2660-REJ	25	MS-RH, #10-24 x 1.50"	2 Res	2600-RSC
5	Cover Plate	1	044122	26	W-FA, #10	2 Res	1712-SC
6	Gasket, Cover Plate	1	042268-3	27	Terminal Block Assy	5	023274-26X
7	CS-HH, 1/2-13 x 1.75"	4	4169-HSC	28	MS-RH, #10-24 x .625"	2	2594-RSC
8	Washer, Lead	4	042268-2	29	Connector	AR	023839-2
9	N-HX, 1/2-13	8	2108-SC	30	CS-HH, 3/8-16 x 1.00"	3	4088-HEJ
10	W-LKS, M, 1/2	8	1812-MSC	31	W-LKS, M, 3/8	3	1810-MEJ
11	W-FA, 1/2	8	1730-SC	32	Gasket, Housing	1	044109
12	CS-HH, 1/2-13 x 2.50"	4	4172-HSC	33	Lens Housing, 8-3/8	1	044106
13	MS-RH, #6-32 x .50"	1	2559-RSC	34	Gasket, Lens	1	044014
14	Mounting Panel	1	044120	35	Lens & Visor Ring	1	044003
15	MS-LH, 1/4-20 x .625"	12	2659-LE	36	MS-RH, #10-24 x .625"	4	2594-REJ
16	Washer, Spring Lock	4	1981	37	W-LKS, M, #10	4	1806-MEJ
17	Washer, Beveled	4	023834	38	Lens Housings, 6-3/8	1	044105
18	W-LKS, M, 1/4	8	1808-ME	39	Gasket, Lens	1	042611-5
19	Light Pipe Fiber Optic 3 Leg	1	044107	40	Gasket, Adapter	1	042611-3
	Light Pipe Fiber Optic 4 Leg	1	044108	41	Adapter, Lens & Visor	1	042612
20	Adapter Assy, Yellow	1	044102-YX	42	MS-RH, 1/4-20 x .75"	4	2660-REJ
21	Adapter Assy, Red	1	044102-RX	43	W-LKS, M, 1/4	4	1808-MEJ

Focal Adapter Assembly Replacement Parts



To Order: Specify Description and Part Number

Item No	Description	Qty. Req'd	Part Number
1	Reflector Assy	1	044101-X
2	Focal Adapter	1	044102
3	Release Ring	1	044121
4	Retainer Pin	3	044110
5	Spring	3	044123
6	SS-SH, #5-40 x .25"	1	4518-SC
7	Red Color Disc	1	042289-X
	Green Color Disc	1	042290-X
	Yellow Color Disc	1	042291-X
	Lunar White Color Disc	1	042291-1X
8	Color Filter Retainer Spring	2	042292-2
9	MS-RH, #8-32 X .375"	2	2572-RSC
10	W-FL, #8	2	1707-SC
11	18 Watt Bulb	1	042365
	25 Watt Bulb	1	042365-3
	18/3.5 Watt Bulb	1	042365-11

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Safetran Systems Corporation
4650 Main Street N.E.
Minneapolis, MN 55421
(612) 572-0466